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NOVEL APPROACHES TO DEVELOPMENT, DELIVERY AND EVALUATION OF A PEER-LED OCCUPATIONAL SAFETY TRAINING FOR LATINO DAY LABORERS

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Abstract

Latino day laborers experience high rates of work-related injuries and are a hard-to-reach group for safety interventions. This study describes the creation and implementation of safety training based in empowerment theory and its evaluation to address three levels in empowerment's hierarchy of change. Pictographic pre- and post-tests were used to assess knowledge level changes. Individual and large-group interviews were conducted to address attitudes and behavior-level changes. Results indicate that day laborers learn and apply lessons from this type of safety training. Findings also offer insight into challenges that day laborers encounter when trying to work safely as well as ideas for future training interventions.

Keywords

safety training; training evaluation; day labor; pictorial assessment

Nearly 120,000 day laborers in the United States look for short-term informal work each day [1, 2]. The majority of them are Latino immigrants who typically find jobs in construction, landscaping, and home cleaning [2, 3]. Day laborers face numerous occupational hazards resulting in high risk for work-related injuries and abuses. Protecting their safety is problematic because of the nature of the jobs they acquire and the lack of formal employment relationships. Perhaps more importantly many socioeconomic factors, including limited formal education and economic resources, undocumented immigration status, and lower safety expectations, make them more susceptible to exploitive and abusive working conditions [3–7]. In response, worker centers across the country have addressed safety and other rights with day laborers through training and advocacy [8, 9]. However, evaluating training effectiveness has been challenging because of limited worker center resources, the laborers' lack of comfort with written assessments, and high rates of loss to follow-up. This study describes the development and implementation of a peer-created and peer-led safety training using the empowerment approach, and the innovative way it was evaluated by a collaborative team of worker center staff and university researchers.

In the hierarchy of occupational hazard controls, worker training is ranked less effective than engineering or work practice controls. Yet, in the ever-changing and unregulated worksites of day laborers, training may be the only immediately implementable tool. Worker training has been shown to improve occupational safety outcomes in many studies and in practice [10, 11].

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Adult education theory stipulates that successful training incorporates the following features. First, the curriculum must reflect topics of interest to workers so that they are motivated to learn. This necessitates worker involvement in curriculum planning [12, pp. 84–97]. Second, training materials must accommodate various learning styles, literacy levels, and small and large group work. Third, experiential learning activities, such as practicing new skills during training, help adult learners gain confidence in their abilities.

Disenfranchised workers will further benefit from the empowerment training model. The empowerment approach, developed by Nina Wallerstein from Paulo Freire's Popular Education model [13], is commonly preferred over traditional didactic methods by worker centers serving Latino immigrants [9, 14]. It encourages learners to think critically about their social contexts in order to increase their motivation to change their own situations [15, 16]. Using the empowerment approach, participants identify their own needs, share experiences, work in groups, and nurture peer leaders, in order to eventually make lasting positive change. The goals of empowerment are to:

1. increase self- and community-efficacy;
2. build stronger community networks and collaboration; and
3. achieve actual health and safety improvements through social action [15].

The empowerment process can be evaluated using the following hierarchy of training outcomes, listed here in order of increasing difficulty to achieve:

- knowledge: cognitive learning gains during the training;
- skills: ability to perform tasks during and after the training;
- attitudes: commitment to use safe work practices;
- individual behaviors: adoption of workplace behaviors affecting safety; and
- social action: collective safety and health advocacy activities [16].

In this hierarchy, empowerment starts with individual awareness, but its overall goal is collective change. With knowledge and skill, gained through experience and training, a worker is more aware of risks and why and how he could protect his safety. When the worker also values his knowledge and skill, he is better motivated to use it. Choosing to perform safely on the jobsite shows individual empowerment in action. Organizing with others to promote workers' interests is at the top of the empowerment hierarchy and demonstrates workers leveraging their power together. In the typical work situations of day laborers, there are formidable barriers to both individual behavior change and social action advocacy, because the worker's level of control is typically very low.

There are also substantial challenges to rigorously evaluating safety training among day laborers at each outcome level listed above. First, knowledge gains are typically measured using written pre- and post-tests, but since many day laborers have little formal education, these tests don't always perform well. Second, skills evaluations require time, space, and resources that a worker center may not have. Third, attitudes are commonly evaluated during follow-up interviews, but because most day laborers lack consistent contact information, rates of loss to follow-up can be frustratingly high. Fourth, as day laborers typically work on informal and private job sites, worksite visits to assess individual behavior changes are often impossible. Finally, social action is an outcome that may manifest only after months or years of participation in empowering processes; capturing this outcome can require years of follow-up.

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THE TRAINING PROGRAM

The training intervention was created using a train-the-trainer empowerment approach and was facilitated by a community-based worker center serving primarily immigrant Latino day laborers in Seattle. Two peer-trainers were selected by the worker center staff as individuals who had worked as day laborers in the past and had subsequently assumed leadership roles at the worker center. The peer trainers and worker center program director developed the training with guidance from university researchers starting in January 2011. The trainers chose the curriculum according to eight priorities identified by worker center members in a previous needs assessment. They reviewed existing training materials available in the public domain and then developed training activities consistent with the empowerment model, further described below. The final training was four hours in length with one hour allotted for each training theme. First, *personal protective equipment (PPE) familiarity* was addressed by presenting various types of PPE and having participants voluntarily explain how they had used them in the past. This facilitated experience sharing and discussion about correct and incorrect PPE use. Second, *correct PPE use* was reinforced when participants were divided into small groups, given a job description, and asked to don appropriate PPE. Presenting each group's work to the larger class again facilitated discussion about when and how workers should use PPE. *Hazard identification*, the third theme, was addressed by having workers in small groups critique illustrations of typical job tasks that contained safe and unsafe work scenarios. In the subsequent full class discussion, groups explained which practices were safe and unsafe and how they could improve unsafe practices. The last hour of the workshop addressed *workers' rights*. Workers viewed a short video, created by the State of Washington's Department of Occupational Safety and Health (DOSH) specifically for training Latino immigrant workers, based on the true story of a Latino worker and his tragic workplace accident. The video addressed workers' right to a safe work environment, adequate training, and access to worker's compensation in the case of injury. Following the video, trainers facilitated a large-group discussion of the immediate and systemic causes that led to the worker's accident.

Since April 2011, the worker center has offered this training to any individual interested in becoming a member of the center and seeking employment through its services. Most training participants are immigrant Latino males aged 18 to 50 years of low economic standing. In order to encourage participation in the training and its evaluation, more specific demographic information was not requested from participants, but worker center membership records indicate that approximately 14 percent of the participants are homeless.

Many day laborers have limited English language proficiency, which makes designing and delivering training more challenging [14]. Limited English language proficiency also complicates application of knowledge to work performance in that it inhibits communication with the employer [17]. The worker center routinely provides English classes to all members, and during the time of this study, these classes placed special emphasis on safety themes. Specifically, day laborers were taught and practiced phrases useful in discussing safety with English-speaking employers and regulatory agencies.

EVALUATION METHODS

Evaluation was conducted to directly assess three of the five types of outcomes posited in the empowerment training model: knowledge, attitudes, and individual behaviors. To quantify knowledge, pre- and post-tests were administered to each training participant immediately before and after the training. Individual attitudes and behaviors were evaluated in one-on-one and group interviews with participants. Skills and social action outcomes

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were not directly evaluated for this study, but changes in these areas were informally observed by trainers and are described in the following discussion.

Knowledge

The knowledge evaluation was created collaboratively by worker center staff and university researchers. It had to be straightforward and relatively short for low-literacy participants unaccustomed to sitting for written evaluations, convenient to administer for the peer trainers, and focused on the training's specific safety themes. Developing the knowledge evaluation was an iterative process; we describe the process here as a guide to others attempting safety training evaluation among day laborers.

The first version of the evaluation consisted of two parts. Participants were first given Clip Art® pictures of PPE and jobs and told to match appropriate PPE to each job. Second, participants were given photographs showing multiple unsafe work situations and told to circle any and all features they deemed unsafe. Instructions were given orally. Although this evaluation tool was relatively easy to create, it had important limitations. Matching PPE with jobs only addressed PPE appropriateness, not correct use. Also, the photographs of real-life situations contained too many details, and functioned better to trigger discussion than to elicit simple test responses. Finally, the evaluation's two separate parts made it too long for the participants to tolerate and confusing for trainers to explain.

In the final version, pictograms were used to clarify and streamline the questions. This version presented participants with pictograms depicting safe and unsafe ways in which common job tasks could be completed. The evaluation presented five job tasks with three pictogram options each (see Figure 1). Pictograms eliminated the clutter and unknowns of real-life photos, better reflected typical jobs of day laborers, and integrated questions of hazard identification and correct PPE use. Participants marked each pictogram as either "safe" with a checkmark or "unsafe" with a cross out. With only one correct answer per pictogram, this evaluation was much easier to interpret than the original. Also, instead of oral instructions, instructions included examples projected as PowerPoint slides. The slides supported the visual learners and ensured that everyone was given standard guidance.

Pre- and post-tests were piloted with 65 participants in four different trainings during this collaborative elaboration process. Once finalized, peer trainers administered the tests to each participant immediately before and after each training session with minimal assistance from researchers. Correct answers were not discussed until after the training and post-tests were completed.

Researchers tabulated the results. Participants earned one point for each time they correctly checked or crossed out a pictogram. Unmarked items were considered incorrect (zero points), unless otherwise deemed score-able. For example, if it became clear that an individual participant did not use cross-outs at all, but rather only checked what he believed were safe practices, it was assumed he understood the question but had misunderstood the instructions. In this case, his unmarked items were assumed "crossed out" and scored as such. Maximum score was 15 points. Scores between pre- and post-tests were compared using paired mean-comparison tests (*t*-tests) with Stata 11.

Attitudes and Individual Behavior

In order to address the higher-level objectives of changes in attitude and individual behaviors, one-on-one interviews and a large-group discussion were conducted with training participants. Interview formats and questions were created collaboratively by worker center staff and the research team. Participants were day laborers who had completed the training three to five months previously.

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One-on-one interview questions were crafted to be understandable to the day laborers, reflect training content, and/or identify areas for future training needs. They included yes/no and open-ended questions that addressed participants' safety attitudes, whether or not they had transferred training lessons to real work situations, and workers' rights issues (see Table 1). Interview participants were selected by convenience sampling. After the morning work assignments were made, worker center staff and research team members asked all remaining laborers who had taken the training if they were willing to participate in the interview. The researcher then conducted interviews with all consenting participants.

The one-on-one interviews were audio recorded and then translated from Spanish into English by a member of the research team who is proficient in both languages. Yes/no responses about work experience (items A, B, D, and E) as well as rights recalled (item C) were counted and summarized. Narrative responses were reviewed for evidence of safety attitudes and behaviors. If a worker used all PPE necessary for the job as he described it (items A and B), it was considered that he appropriately used PPE. If he explained a technically sound process he used in hazard identification (item B), the worker was regarded as appropriately identifying hazards. A worker's decision to talk with others about worksite safety (item E) was evidence of his positive safety attitude and behaviors. The prevalence of rights violations (item D) was an exploratory question to give context to item E.

The large group discussion posed questions similar to the one-on-one interview, but in a group setting to encourage more workers to participate and ideas to develop [18, pp. 53–55]. The discussion was integrated into the weekly meeting of worker center members and was led by worker center staff. The large group interview was audio recorded and translated into English by the same researcher. Responses were reviewed for evidence of safety attitudes and behaviors. Patterns and themes in responses were identified, compared and contrasted with data from the one-on-one interviews, and summarized.

Additionally, the two peer trainers and the worker center program director participated in a semi-structured small group interview after having facilitated the training for five months. The same researcher facilitated, audio-recorded, and translated this interview into English. Results were reviewed to identify changes trainers saw in training participants, and were triangulated with the other interview results.

RESULTS

Knowledge

One hundred twenty-five day laborers participated in training after the evaluation's pilot phase. Any evaluation that was missing questions or lacked its pair was excluded from the final dataset. After reviewing all evaluations, 96 pairs, representing 77 percent of total training participants, were available for analysis.

Thirty-eight of the participants (40%) improved their test scores after the training (see Figure 2). An equal number of workers had no change in their test scores, including 18 workers (19%) who scored perfectly on both the pre- and post-test. The remaining 20 workers (21%) had a decrease in test score after the training. Overall, there was a small but significant improvement of + 0.52 points (95% C.I.: 0.11–0.93; $p = 0.013$) (see Table 2). Only two individual test questions showed statistically significant improvement after the training; these dealt with correct ladder use and trenching.

Improvements were not equally distributed among all participants. Eighteen participants (19%) had pre-test scores between 0 and 9 points, while 57 participants (59%) scored between 10 and 14 points, and 21 (22%) scored a perfect 15 points on their pre-tests. Among

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those without perfect pre-test scores, the lower-scoring group of pre-testers showed more improvement on their post-tests (+ 2.0; 95% C.I.: 0.89–3.11; $p = 0.001$) (see Table 3). Improvements among the higher-scoring pre-testers were not statistically significant.

Attitudes and Individual Behavior

One-on-One Interviews—Out of 125 day laborers trained, only 10 training participants (8%) were identified and available at the worker center on interview mornings and were willing to participate in one-on-one interviews. In response to questions about jobs requiring PPE since the training, nine of 10 workers reported having gardening jobs, but only six reported using appropriate PPE for this work. Reasons for not using PPE included the belief that PPE wasn't necessary, not being accustomed to PPE use, and lacking access to adequate PPE:

> It was working with a hoe, it was light work.
>
> I practically don't need PPE. … Well, I mean, could it be that one isn't used to, or I'm not used to using safety glasses or using earphones?
>
> It's not that I thought I didn't need it. It's that it wasn't available.

Regarding hazard identification, similar numbers of workers had experience in digging and using electrical tools, with fewer laborers having worked at heights and with chemicals. Yet workers with experience more readily identified hazards and injury prevention strategies at heights and in trenches than with electricity and chemicals. For example, both workers with ladder experience explained in detail how they set up and secured the ladder to prevent falling:

> I nail [stops in the deck] so my ladder doesn't slip.
>
> [The ladder] was at the adequate angle and passed above the roof more than the minimum distance.

Similarly, four of five workers with digging jobs recognized the need for special precautions at deeper depths:

> I noted that nothing could fall down, nothing could cave in.
>
> There was a wooden retaining wall to prevent cave-in.
>
> Underground tubes [pipes] were not in service.

Regarding electric power tools, however, while three of four workers mentioned using some appropriate PPE, no workers reported using hearing protection. Also, only one worker explained taking measures to avoid electrocution: "I don't use them near water. I make sure the cables aren't broken or cracked." This same worker was the only one who explained how to read the label of a chemical bottle and chose appropriate PPE: "I always read what's in it and the precautions I must take, the instructions for use and what it contains."

Almost all workers (nine of 10) could name at least one worker right, but responses were not uniform. Although the right to a safe workplace was one of the most commonly recalled rights (reported by four workers), only two named it as the first right they remembered. Other rights commonly reported were:

1. asking for what is needed (reported by four workers);
2. fair wage payment (reported by three workers); and
3. being provided appropriate tools (reported by three workers).

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Half the workers reported that their rights had been disrespected at least once in the past, mostly through wage theft. Additionally, one worker described how his safety rights end up disregarded:

> Generally, we Latinos, we don't respect our rights, because we're Latinos. There have been times when I was doing jobs, they gave me jobs, and I knew I needed more protection. But they gave [the job] to me, and [although] I knew [better], … I did it. I noticed that I needed a harness, that I didn't have it, and I shouldn't have done [the job], but I did it. It was cheating. [I did it] because I didn't have anything else to do. This was a way to work. … The boss told me, just do what can be done, and so I did it.

Six of ten workers reported having discussed workplace safety with coworkers and/or employers. Of them, half reported that this resulted in safer work conditions. One worker summarized why speaking up doesn't always help:

> There are some employers who don't have … gloves, they don't have anything. And they're hoping that [the laborer] works miracles. And how can we work like that? Not everyone, but there are some that have nothing. … There are times when I ask for the tools needed, but employers don't want to buy them. … And sometimes all they have are really old tools, inadequate. … And if it's not good, oh well. Either way you have to work.

Large Group Discussion—Thirty-one worker center members who had received training participated in the large group discussion, and their comments reiterated themes from the one-on-one interviews. Workers expressed understanding of specific training content. Workers discussed PPE use, hazard identification, and exercising one's rights:

> A person who's working with concrete … needs different PPE from the people who are working in gardening.

> If we are going to leave [a big] hole there for the next day, this workshop taught us to put bars around the hole so in the night the people will see it, know that something's there, it's dangerous.

> You can talk to your employer about [specific hazards]. One knows what to say based on what we learned.

However, many obstacles were noted between knowing and doing, and workers reported not always working safely. Most notably, many workers believed that they did not take enough personal responsibility for their safety, as evidenced by their unwillingness to bring their own PPE to each job:

> We aren't kids, but in reality we are irresponsible. We say, 'Oh we know everything,' but we don't bring what the program requires of us.

> We need to be uniformly more responsible!

Workers were enthusiastic about being trained and reported wanting further safety training for specific jobs. They also expressed that the peer-training model increased their feelings of self-efficacy:

> There's nothing better than listening to people from here, who live with us and share our experiences.

> If … someone explains to you what happened to him, that's not going to happen to you.

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Staff and Trainer Interview—Finally, in the small group interview with the peer trainers and program director, each described changes she or he noticed after the training. All commented on the benefits of enabling in-house trainers, as compared to previous years when outside instructors were invited to the worker center to facilitate OSHA 10 trainings:

> [Before] with the staff, if we didn't take the OSHA10 class, we didn't know much. We'd just say [to the laborer], 'Take care of yourself!' On an institutional level, the institutional vision didn't change. … It wasn't a profound change like now. … Now, with this training, the message is more concrete.

Trainers also felt that their new training was more useful to day laborers than previously offered OSHA 10 classes because it related more directly to workers' needs and required less time commitment from workers. Offering the class each month and requiring it during the membership process assured that every laborer received training.

Similarly, they felt that a stronger safety culture was already developing among the workers, reporting, "They are building a consciousness about safety." Trainers observed more laborers asking safety questions and requesting PPE before accepting job placements. For example, they reported workers saying, "We are going to clean windows? We are going to need a harness." They saw trained workers sharing safety messages with those who still lack understanding, reporting "Those who are already responsible serve as an example." They also reported hearing workers taking this message to Latino workers not affiliated with the center:

> [When] there's a guy … doing gardening outside, our workers will come back and tell me, 'The gardener is doing his work without safety glasses or gloves! … Doesn't he know he should use them?' [And they'll say to him,] 'Hey you sir, listen! You should use safety glasses and gloves!'

The trainers explained at length the empowerment process that they have been observing among worker center members:

> We're trying to motivate them to communicate with the employer to say when they need more protection or when something isn't right. … There are occasions in which two or three words cause the employer to understand and to react, too. There are times when [the employers] are waiting for you [to say something]. They have [PPE] prepared but they let you keep working. So if you have a suggestion and you communicate it … organize! 'Something happened to the hardhat; something happened to the gloves; something happened with the tool.' Now, you don't have to keep going with the idea that 'I have to get the work done.' You can work protected, avoiding accidents.

DISCUSSION

This study involved collaboration between worker center staff and university researchers to develop, deliver, and evaluate occupational safety training for immigrant Latino day laborers. The safety training intervention addressed the safety priorities of worker center members using curriculum development and teaching strategies that promoted empowerment. The evolution of an evaluation method appropriate and feasible for the training audience is a key feature of this study. Multiple and in some cases overlapping sources of data strengthened the findings, but further application and refinement of the methods used are needed to better support occupational safety among day laborers. These issues are discussed below in terms of the specific objectives of the training.

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Knowledge

The knowledge evaluation showed small but significant knowledge gain among participants following the training. Among participants without perfect pre-test scores, more (about 49%) went on to improve their scores in the post-test, while about 27 percent showed no change in score. The lack of change in a participant's score may reflect disinterest in the training topics or misunderstanding of how to take the test. Given the enthusiasm for training expressed in the interviews, it is unlikely that disinterest played a significant role in stagnating scores. Therefore, more emphasis on giving instructions and aiding non-literate participants may be required in future applications of this tool. However, given the limited human resources capacity of many worker centers, offering one-on-one instructions for each struggling participant is likely to be unfeasible.

For 21 percent of participants, including three participants who scored perfectly on the pre-test, post-test scores declined from the pre-test. It may be that the four-hour-long training can leave workers drained and unmotivated to complete the post-test properly. However, the trainers pointed out that a four-hour, one-morning training is much more effective than a two-day OSHA 10 class because day laborers, with their pressing financial needs and unpredictable work schedule, are not likely to attend a full OSHA 10 class. Discarding non-influential pictograms could reduce the number of participants who cannot give attention to the post-test. Also, rewarding participants who score above a predetermined standard on the post-test with a certificate of knowledge may increase motivation to complete post-tests.

With 22 percent of participants earning a perfect score on the pre-test, it is possible that the evaluation tool may be too simple for a substantial minority of workers. That only two job task scenarios elicited statistically significant score improvements suggests that the evaluation tool could be further developed, discarding less influential pictograms and introducing more complex ones. The diversity of work experiences and knowledge levels among day laborers makes it difficult to address the day labor work experience uniformly. However, day laborers' wealth of experience and knowledge can be used to their benefit if organized and shared among them. It is worth noting that the participants with the least knowledge before the training reaped the most benefit from it, as shown by their strong post-test performance. This may be expected, as the empowerment approach to training stipulates that participants share their experiences to learn from one another; those with more experiences were able to teach those with less.

The empowerment approach requires balancing research and action agendas, creating partnerships that "are both *empowering* for community members and enable community members to work in an *empowered* manner to foster change in the community (emphasis in original)" [19, p. 311]. As the worker center is taking increasing responsibility for training its membership and evaluating training effectiveness, it was decided that trainers (not researchers) would administer pre- and post-tests in each training. In this learning process, some evaluations ended up missing questions, and in one training session evaluations were overlooked altogether. While this decreased the number of analyzable test pairs, it reflected an empowerment process in the worker center itself. That the worker center collaborated equally with researchers in designing the evaluation tool improves its chances for success, because it reflects something that the worker center and its staff want to use.

A possible improvement to the evaluation and learning process would be embedded testing, in which exercises and activities that would allow instructors to assess gains at the knowledge and skills levels are built into the training sessions themselves [20]. For example, an exercise of choosing, inspecting, and donning the proper respirator for a particular hazard would test the training participants in a fairly non-threatening way. While this would require

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considerable additional preparation and in-class focus from the trainers, the investment might be worth it in terms of both improved learning and assessment of skills.

Attitudes and Individual Behavior

Individual and group interviews indicated that not all workers have adequate PPE for their work, for various reasons. Helping workers accept and comply with safety standards in the United States is complicated by the fact that immigrant workers come with diverse work experiences and often have lower safety expectations [6]. Also, the notion that day laborers "don't respect [their] rights because [they're] Latinos," suggests a felt need to live up to a stereotype of "the hardworking Latino." While this need is also motivated by limited work opportunities and economic resources available to Latino immigrants, deconstructing this stereotype for day laborers and employers alike must be a component of successful safety promotion efforts.

That some Latino day laborers attributed their failure to use safe work practices to their own irresponsibility should not be surprising. The debate between personal responsibility for safe work behaviors versus eliminating or controlling hazards through systems engineering remains very much alive even among safety professionals and on worksites far more sophisticated than the typical day laborer's workplace [21]. In the day labor context, the training approach needs to find a balance between these perspectives. Empowerment education in the Freire tradition emphasizes social and economic context, and the decision of a day laborer as to whether to work on a roof with no fall protection is often made in an instant, without the luxury of deliberation, and based in the worker's economic context. The training described in this study provided for discussion about these tensions and contradictions, and one could interpret the trainees' comments about improving personal responsibility as a step along the way to developing a better set of choices.

This training inverts the hierarchy of controls to some extent in its focus on PPE. However, the fact that even basic PPE is frequently unavailable evidences the continued need to provide resources to laborers, education to employers, and regulatory enforcement on the work site. While the sense of personal responsibility expressed by some of the laborers probably accurately reflects their experience and perception (i.e., if I don't protect myself, no one else will do it for me), it is also important to hold other responsible parties accountable, employers in particular.

Workers were able to identify real workplace hazards regarding ladder use and trenching, as taught in the training. Safe chemical handling and electrical power tool use were not main foci of the workshop, and so inability to recall specific electrical and chemical safety measures is not surprising. However, this suggests that workers are unfamiliar with electrical and chemical safety, and it is important to include these themes in future safety trainings.

That only two participants listed their right to a safe worksite as the first right that came to mind, and rights to wage and safety were listed with equal frequency, suggests that workers do not value safety rights above their other rights, such as the right to a fair wage. The attention on wage payment is understandable, given the economic pressures day laborers face, the precariousness of their employment, and the ongoing campaign to raise awareness about wage theft at this particular worker center. However, the laborers' vulnerability is all the more reason to strongly promote safety. Lacking a formal employer-employee relationship, day laborers need other structures and organizations to at least partially substitute. The popular anti-wage theft campaign at this worker center shows the power that worker centers have in leveraging change with and for their community. Extending this momentum to other rights, like workplace safety, is an important next step. The situation of

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day laborers is not unlike that often portrayed for small construction contractors who argue that following safety and health regulations can put them at a competitive disadvantage with bidders who ignore such standards. Without a level playing field, either through enforceable regulation or through owner demands of contractors and workers doing work on their projects, the conflict between earning a day's wage and working safely remains a real one.

While it is encouraging that most respondents have discussed workplace safety with their coworkers or employer, it is disappointing that half the workers who spoke up did not feel that it helped improve safety. Reinforcement of language skills in the accompanying English classes may help facilitate effective discussion with monolingual employers. Also, while seemingly ineffective in the short-term, the safety conversations that did occur are part of the safety-culture–building process and are the first steps toward greater social action at the top of the empowerment hierarchy.

Conducting safety training in day laborer communities presents significant challenges. Many existing safety training materials are available only in English and/or rely on didactic teaching methods, making them inappropriate for most day laborers [22]. The curriculum creation process described in this study assures that training content is accessible and of interest to day laborers and fully engages the worker center. A similar process has been described by at least one other group working with Latino day laborers [23].

Evaluating training effectiveness among day laborers, even at lower-order outcome levels, presents additional challenges. Knowledge evaluations are tricky because most laborers are unfamiliar with written evaluations. Implementation of pictogram evaluations like those described in this study has not been previously reported in the literature and therefore presents a new and potentially useful way to assess knowledge gains in low-literacy groups. Evaluation of attitudes and behaviors among day laborers is especially challenging because day laborers are constantly on the move, leading to high rates of loss to follow-up. The small sample of trainees who participated in individual interviews (8%) is a limitation of the current study. However, the large group discussion successfully involved many more laborers (25% of those trained), yielding valuable qualitative data that complemented the individual interviews.

CONCLUSIONS

This study showed that a carefully organized community-based occupational safety training intervention can have positive outcomes in the day laborer community and benefits for the worker center itself. Pictograms worked relatively well as an evaluation tool and warrant further development and application. Yet moving day laborers from basic knowledge outcomes to higher-level objectives—attitudes, behaviors, and social action—is a long-term project. Identifying these changes requires follow-up interviews and possibly other evaluation methods, such as worksite visits, in the future. Worker centers can play an important role in not just organizing but also empowering day laborers. The nascent safety culture that both workers and trainers perceive in this worker center is the beginning of the empowerment process and the foundation for lasting change.

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NOTES

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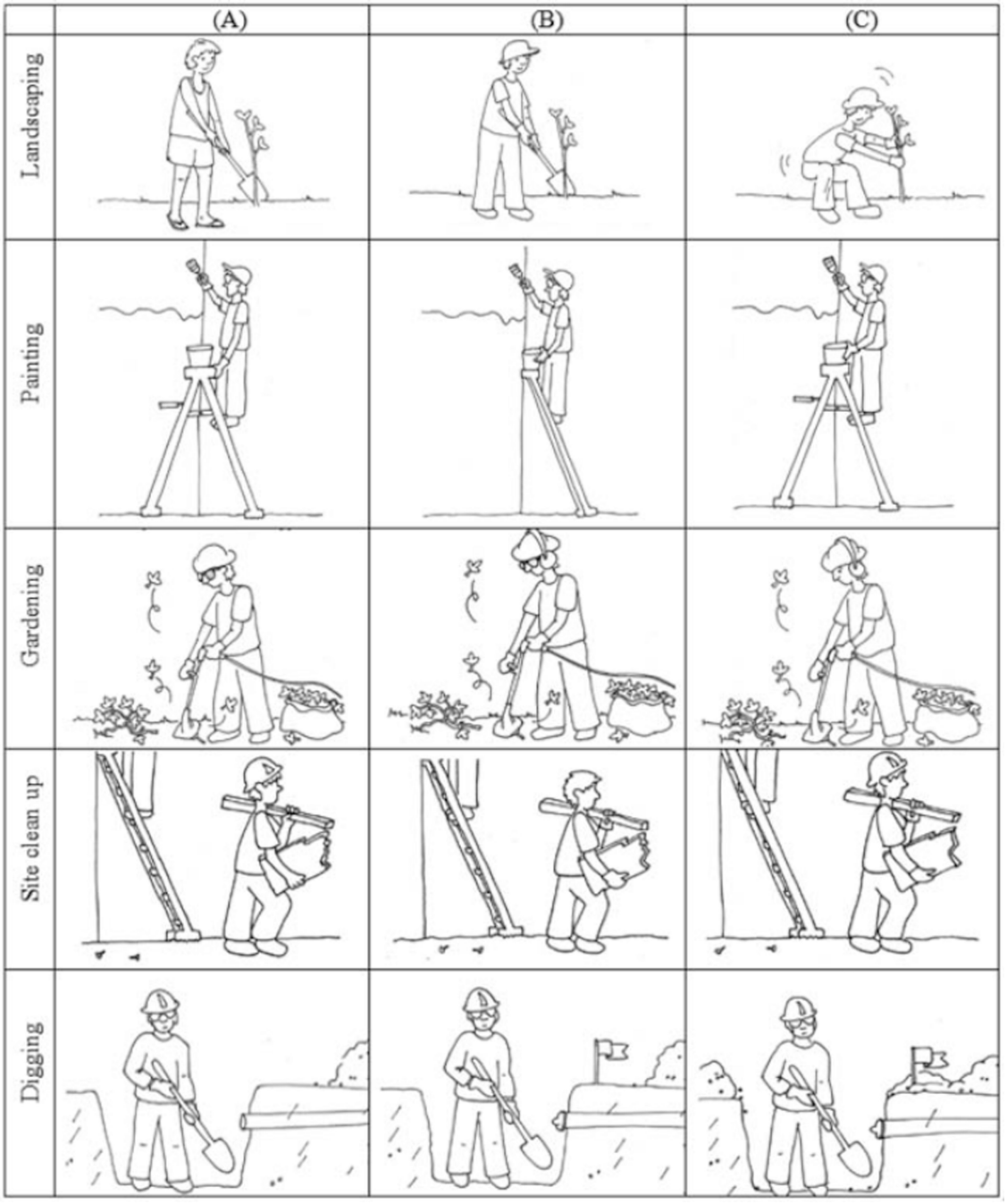

Figure 1.
Knowledge evaluation.
Note: Safe practices are: Landscaping, B; Painting, A; Gardening, B; Site clean up, C; and Digging, B. To earn one point each, these should receive a check mark; all others should be crossed out.

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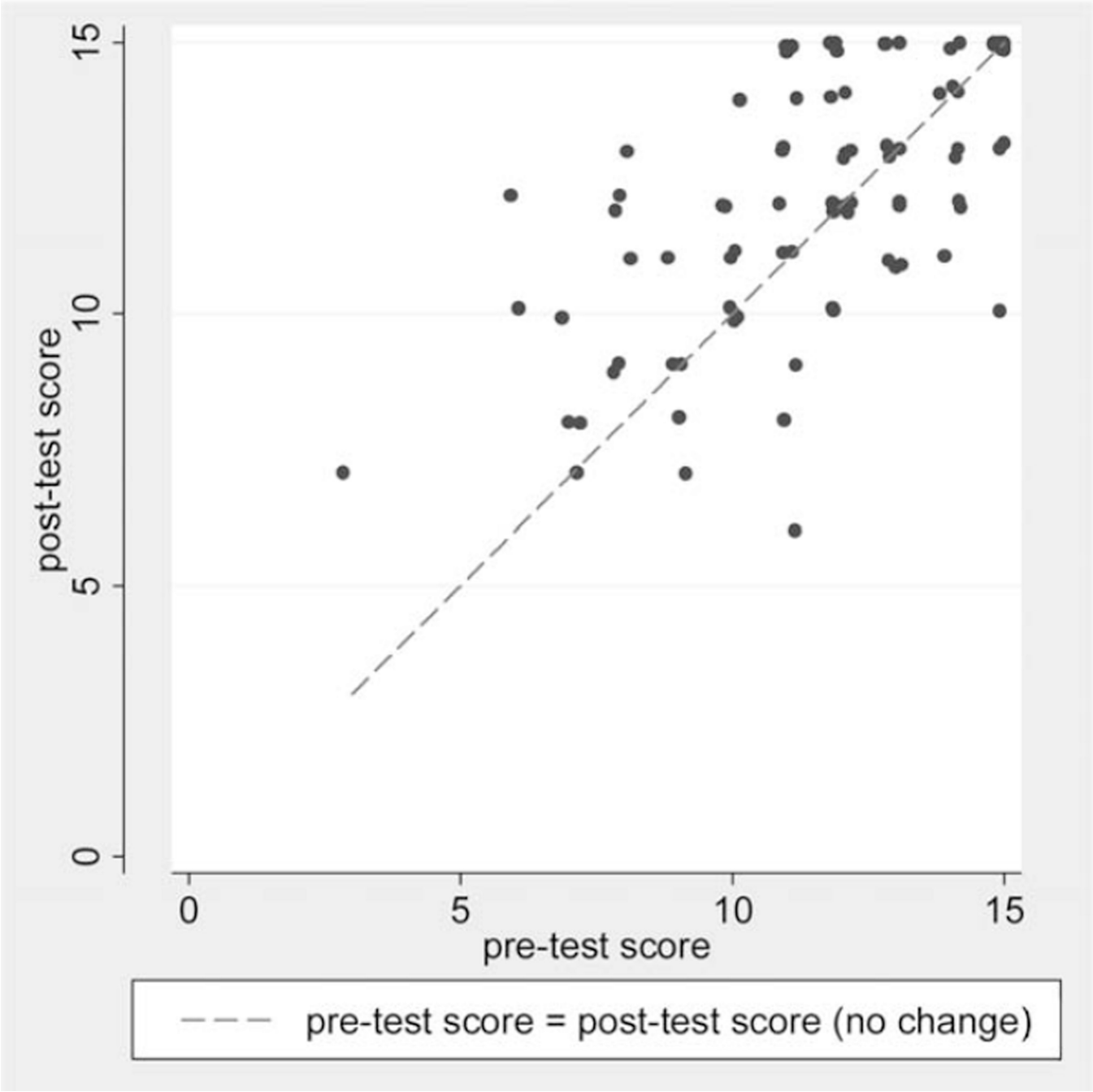

Figure 2.
Pre-test and post-test scores ($N = 96$).

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Table 1

Attitude and Individual Behavior Evaluation

(A) Have you had a job in the last two weeks or month in which you needed PPE? If yes, please tell me what the job was, why you needed PPE, and how you used it. If no, what types of job(s) have you had in the last two weeks/ months? Please tell me about why you think you didn't need PPE for that job.	
(B) Have you had a job in the last two weeks or month in which you: Worked at heights? Did trenching or excavation? Worked near or with electrical power? Worked with paint, asbestos, silica, or particulate matter?	If yes, describe to me how you did the work and how you made it safe.
(C) What are some of your rights on the worksite?	
(D) In your work experience, have you felt that any of your rights were not respected? If yes, please describe how you responded.	
(E) Since the training, have you spoken with anyone at the worksite about safety? If yes, please describe to me what happened.	

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Table 2

Results Overall, per Question ($N = 96$)

Question	Mean pre-test score	Mean post-test score	Average score difference between	Standard deviation	95% confidence interval
All items	11.85	12.38	0.52[a]	2.02	0.11–0.93
Landscaping	2.72	2.68	−0.04	0.56	−0.16–0.07
Painting	2.08	2.33	0.25[b]	0.81	0.09–0.41
Gardening	2.49	2.49	0.00	0.83	−0.17–0.17
Site clean up	2.36	2.39	0.09	0.88	−0.16–0.20
Digging	2.20	2.50	0.29[b]	0.86	0.12–0.47

[a]Paired *t*-test *p*-value < 0.05.

[b]Paired *t*-test *p*-value < 0.01.

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Table 3

Results per Pre-Test Score Range ($N = 96$)

Pre-test score range	*N*	Mean pre-test score	Mean post-test score	Average score difference between tests	Standard deviation	95% confidence interval
0–9	18	7.56	9.56	2.00[b]	2.22	0.89–3.11
10–14	57	12.05	12.46	0.40	1.95	−0.11–0.92
15	21	15.00	14.57	−0.43	1.21	−0.98–0.12

[a] Paired *t*-test *p*-value < 0.05.

[b] Paired *t*-test *p*-value < 0.01.